

1. A memory storage device having an operating system which uses at least one inode to record and find segments of a data file, the inode comprising:

a plurality of rows, and

5 a portion of the rows being written with direct extents pointing to data blocks storing portions of file segments, at least two of the extents pointing to data blocks having addresses in different logical volumes.

2. The memory storage device of claim 1, wherein  
10 each extent has a field for an address of a logical volume.

3. The memory storage device of claim 1, wherein the inode is capable of having any portion of the extents therein be indirect extents.

4. A memory storage device having an operating  
15 system which uses at least one inode for accessing file segments, the inode comprising:

a plurality of rows; and

20 a portion of the rows storing extents pointing to data blocks, each extent having a field to indicate whether the extent is an indirect extent or a direct extent, each direct extent of the inode further comprises a field for a logical volume pointer.

5. The memory storage device of claim 4, wherein a first and a second one of the direct extents associated with  
25 a data file have pointers for different logical volumes.

6. An automated method of storing data files in a memory storage system, comprising:

assigning an inode to a data file; and  
writing a plurality of extents in the inode, each  
extent pointing to a sequence of one or more data blocks for  
storing a segment of the data file, at least two of the  
5 extents pointing to different logical volumes.

7. The method of claim 6, further comprising:  
reading a first and a second of the extents mapping  
to a first and a second logical volume, respectively; and  
accessing data in the first and second logical  
10 volumes in response to reading the extents.

8. An automated method of storing data files in a  
memory storage system, comprising:  
assigning an inode to a data file to be stored; and  
writing a plurality of extents in the inode, each  
15 extent pointing to a string of one or more data blocks for  
storing a segment of the data file and having a field for  
indicating that the extent is one of an indirect extent and  
a direct extent, the act of writing includes writing an  
address pointer in each extent, the address pointer  
20 indicating a logical volume and an offset of a data block in  
the logical volume.

9. In a memory storage device employing an  
operating system comprising instructions for a method for  
storing data files, the method comprising:  
25 writing a plurality of extents to an inode assigned  
to a file, at least two of the extents pointing to different  
logical devices;  
writing data to first and second data blocks, first  
and second ones of the extents pointing to the first and  
30 second physical data blocks;

inserting an indirect extent in the inode between the first and second ones of the extents, the indirect extent pointing to a third physical data block; and

5 writing at least one extent to the third physical data block, the one extent pointing to a physical data block storing a segment of the file.

10. The method of claim 9, further comprising:

writing a start address field to each extent, the start address field including a pointer to a logical volume  
10 portion and a pointer to a data block in the logical volume; and

writing a length field to each extent, the length field fixing the number of consecutive data blocks pointed to by the extent.

15 11. The method of claim 9, the operating system being a UNIX based system.

12. A distributed storage system, comprising:

a global cache memory;  
a plurality of processors coupled to the global  
20 cache memory, each processor having a local memory for  
storing an operating system; and  
a plurality of data storage devices coupled to the  
global cache memory, the devices and processors capable of  
communicating by posting messages to each other in the cache  
25 memory, each of the devices including a processor and local  
memory storing an operating system, each operating system  
having an extent based file system for abstracting file  
names to physical data blocks in the devices by assigning an  
inode to each file, each inode adapted to store extents  
30 having a field to point to a logical volume.

13. The system of claim 12, wherein each extent includes a field to indicate whether the extent points to a block of extents or a block of data.

14. The system of claim 12, wherein each extent 5 includes a field to indicate a logical volume storing the data block.

15. The system of claim 12, each operating system being a UNIX based system.